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ABSTRACT

The theoretical model of a good teacher has evolved through three stages: (1) the subject-matter model, which was predominant in the 19th century and through the 1930s; (2) the trait-factor model, which accompanied the "baby boom" era of the 1950s and 1960s; and (3) the instructional design model, whose development paralleled the emergence of the global economy of the 1980s. In the subject-matter model, the teacher was perceived as a scholarly, cultured mentor, who devoted his or her life to inspiring young people to develop a love of learning. Later, according to the trait-factor model, in addition to being a mentor the teacher became a facilitator of personal and social growth, with emphasis on identifying the qualities of teachers who can nurture a child's total development. The instructional design model subsequently represented a shift from a psychology of learning to a psychology of instruction, with the teacher focusing on how to improve individual students' performance by employing a combination of human and technological resources. The paper concludes that there have been many undergraduates who initially appeared to be poor prospects for teaching but by dint of conscientious effort in their teacher education program have gone on to become both systematic and humanistic teachers. (Contains approximately 55 references.) (JDD)

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Three Models for Teaching and Learning

by

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Three Models for Teaching and Learning

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Introduction

E. L. Thorndike, in 1912, said it rather well:

> **We change the world in which we live. We change the earth's form, whether we only scrape out a hole in which to hide, or remove mountains to join oceans. We change its living things when we kill one bird or when we plant or destroy a forest. Our fellow humans and our own natures are no less truly changed by what we are and do . . . The art of human life is to change the world for the better—to make things, animals, plants, humans, and oneself more serviceable for life's ends.** (p. 1)

We look to our schools to bring about change because they are responsible for our most precious human resource: children. This is a formidable mission, for nothing is as complex as the behavior of a human being. Yet, ironically, so important a concern as the nature of teaching and learning was not considered a scientific subject worthy of study until the late nineteenth century. As a result, of all the applications of the scientific method of inquiry, the study of teaching and learning has been among the last to develop.

Teaching: Art or Science?

Whenever teaching is discussed, the inevitable question arises as to whether teaching is an art or a science. Many people prefer to consider teaching an art because teachers must draw on individual experiences, emotions, and values that seem to occur outside the province of science (Gingell, 1983; Highet, 1957). Others believe that teaching and learning can be studied by the scientific method (Shulman, 1986; Skinner, 1968; 1983; 1984). Who is right? Is teaching an art or a behavioral/cognitive science?

Eisner (1985) argues that teaching is an art in four ways:

- **Teaching can be performed with such skill and grace that, for the student as well as for the teacher, the experience can be aesthetic, yielding intrinsic satisfaction.**
- **Teaching is an activity wherein judgements are based on qualities that unfold during the course of action.**

- **Teaching is a heuristic and adventurous activity that demands imagination and inventiveness in the teacher.**
- **Teaching often achieves ends, or outcomes that emerge from the process itself; that is so say, found in the course of interaction with students rather than preconceived and efficiently attained** (1985, pp. 175-177).

Flinders (1989) believes that good teachers develop a *perceptiveness*, the ability to pick up on student attitudes, motives, and beliefs, in order to send out a compelling message: *I care about who you are and what you have to say* (Flinders, 1989). Many teachers seem to acquire these intuitive skills all by themselves; with others, they develop through the years of formal, academic preparation for teaching and later from the countless human interactions that occur during the course of a teaching career. Philip Jackson's (1965) early research, for example, suggested that teachers engage in as many as a thousand interpersonal interactions each day. This is an impressive number, particularly if we consider the intricate nature of even the most routine instances of face-to-face communication in the classroom. Some teachers are better able than others to distill unique and effective interpersonal skills from these experiences.

The "art" of teaching grows with increased expertise and experience, but it has a developmental tempo all its own. The "science" of teaching, however, is a factor over which we all have control. Because the U.S. is a scientific and technological leader in the world, we can and should use the technology we have created to help our schools (Sununu, 1986). Teachers will increasingly utilize (1) the products of psychology to understand how humans act and think, and (2) the methodologies of instructional design theory and technology to develop efficient, cost-effective ways to deliver instruction. Teachers will practice their profession within a total teaching/learning environment with access to a wide array of diagnostic and instructional technologies. Teaching and learning will occur in settings that vary from the traditional schoolroom to studio-generated "distance" instruction via satellite transmission. Teachers will be *empowered* by new technologies, and the profession of teaching will be *enhanced* by the products of the behavioral and cognitive sciences, as well as instructional technology. But the *management* of tomorrow's school will surely succeed or fail on the degree of artistry of the principal player on the classroom stage: the classroom teacher.

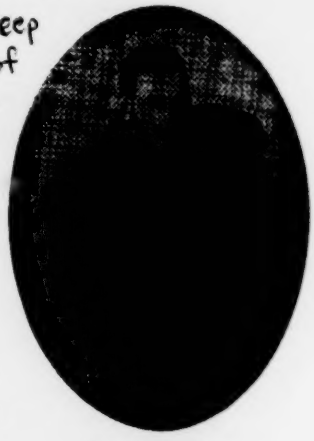
THREE MODELS FOR TEACHER EDUCATION

The overwhelming majority of teachers today are the products of colleges of education, which are usually a part of four-year colleges or universities. These teacher-education institutions typically carry

out the mandates of state departments of education by offering an array of courses and student teaching experiences that qualify candidates for a state teaching certificate. The theoretical model of a good teacher has evolved through three stages: (1) The **Subjectmatter Model**, which was predominate in the 19th Century and through the 1930's; (2) the **Trait-factor Model**, which accompanied the "baby-boom" era of the 1950's and 1960's; and, (3) the **Instructional Design Model**, whose development paralleled the emergence of the so-called "global economy" of the 1980's.

Subject-matter Model: Teacher as Mentor

In the **Subject-matter Model**, the teacher is perceived as a scholarly, cultured mentor, who devotes his or her life to inspiring young people to develop a deep love of learning. This is a role shaped by a heritage of two thousand years of Western culture. Although classical writers often lampooned the character of teachers (consider Washington Irving's portrayal of the sleazy school-master in *The Legend of Sleepy Hollow*), the dedicated, charismatic teacher has a revered place in our history. For most of us, the memory of an outstanding teacher is one of the enduring legacies of our childhood. An example was the great Russian writer, Leo Tolstoy, who was also a charismatic teacher. In an era of rigid, authoritarian class barriers, he created a classroom climate of freedom, creativity, and self-worth. One of his pupils left a record of some of his experiences at Tolstoy's school for peasant children:



Leo Tolstoy

> **I was a pupil of the school in Yasnaya Polyana. I loved the school, and I loved Leo Nikolayevich [Tolstoy]... I remember that he had the most sincere, childlike attachment for us. It was a village commune, but not one depending on force—rather, a commune united by love... Like the brand of Jerusalem, it has remained on my soul and to this day I bear it there (Mueller, 1963, p. 437).**

Before the development of teacher-education institutions, called "normal schools" in the 19th century, it was assumed that a love of scholarship and a love of teaching were about all one needed to be a great teacher, whether standing before first-graders or lecturing to college students. By the turn of the century, however, teaching began to develop the characteristics of a profession, such as (1) having a database of knowledge and principles of teaching and learning; (2) requiring objective, decision-making practices and procedures, and (3) maintaining a commitment to what is best for the client, not what is easiest or most expedient (Darling-Hammond, 1985; Sergiovanni & Starret, 1988).

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Trait-factor Model: Teacher as Facilitator

The baby-boom of the 1950's created a tremendous demand for teachers, especially for the elementary and middle-school levels. Children came to school from family and cultural backgrounds of ever-widening diversity. In addition to teaching the 3 R's, schools became responsible for the development of each child's personal and social growth. According to Rivlin (1955), one of the educational writers of that time:

> **There is little that the school teaches that is worth achieving if the price is a maladjusted youngster. Of what avail is it to give him or her a rich array of skills and a wealth of informational background if one is too disturbed to be able to use them?**

With the Trait-factor Model, the teacher interacts with students in small groups whenever possible, always encouraging student-generated discussion.

As a consequence, the teacher's role was greatly expanded. In addition to being a mentor, the teacher became a *facilitator* of personal and social growth, helping young people to move through the stages of development from childhood to adulthood. The questions then became, "What are the qualities of a teacher who is expected to nurture the *total* development of the child in the classroom?" and "How can these traits be developed in a teacher-training program?" The **trait-factor model** was based on principles of personality development derived from the fields of mental health and psychotherapy. The traits were defined from a liberal, humanist frame of reference, which elevated the concern for students' mental health to the same level as teaching subject-matter. Many teachers found themselves doing almost as much social work in the classroom as teaching subject-matter.

In the 1960's, colleges of education began to use the research methods of clinical psychologists in order to define the qualities of a good teacher. Researchers went into school districts and asked students, teachers, administrators, and parents to identify, by means of rating scales, the qualities of the teachers they perceived as being very effective. The objective was to design a teacher education program that would develop superlative personality traits in prospective teachers. Research suggested that personal characteristics were as important, perhaps more important, than scholarly attainments.

Research on Teacher Characteristics

As a result of this emphasis on personal characteristics, many studies were conducted that focused on teachers who were the most successful in motivating students to learn and who were most liked by students. Perhaps the most comprehensive study of teacher traits was conducted by David Ryans (1959; 1960; Ornstein, 1990). More than 6,000 teachers in 1,700 schools were involved in the study over a six-year period. Respondents were asked to identify and describe a teaching trait that they believed made a difference between success and failure. These critical traits and behaviors were then reduced to a list of 25 effective and ineffective behaviors. Ryans went on to develop a bipolar list of 18 teacher traits (e.g., original vs. conventional, patient vs. impatient, hostile vs. warm). Respondents were asked to identify the approximate position of teachers on a seven-point scale for each pair of characteristics. (A seven-point scale makes it easier for raters to avoid mid-point responses and nonpositions).

Figure 1

TUCKMAN'S TEACHER CHARACTERISTICS

1.	Original	Conventional
2.	Patient	Impatient
3.	Cold	Warm
4.	Hostile	Amiable
5.	Creative	Routinized
6.	Inhibited	Uninhibited
7.	Iconoclastic	Ritualistic
8.	Disorganized	Organized
9.	Unfair	Sociable
10.	Capricious	Predictable
11.	Cautious	Outspoken
12.	Disorganized	Exacting
13.	Unfriendly	Friendly
14.	Resourceful	Helpless
15.	Reserved	Purposeful
16.	Imaginative	Structured
17.	Erratic	Systematic
18.	Aggressive	Passive
19.	Accepting	Critical
20.	Quiet	Bubbly
21.	Outgoing	Withdrawn
22.	In control	On the run
23.	Flighty	Conscientious
24.	Dominant	Submissive
25.	Observant	Preoccupied
26.	Introverted	Extroverted
27.	Assertive	Soft-spoken
28.	Timid	Adventurous

Source: Tuckman, B. W. (1986). Feedback and the change process. *Phi Delta Kappa,* p. 342.

The 18 teacher characteristics were defined in detail and further grouped into three patterns of successful vs. unsuccessful teachers:

1. **PATTERN X: Friendly, responsive *vs.* aloof, egocentric**
2. **PATTERN Y: Responsible, businesslike, systematic *vs.* evading, unplanned, slipshod**
3. **PATTERN Z: Stimulating, imaginative *vs.* dull, routine**

These three teacher trait patterns were the major qualities singled out for further study. Elementary teachers scored higher than secondary school teachers on the scales of friendly classroom behavior (Pattern X). Differences between women and men teachers were insignificant in the elementary schools, but in the secondary schools women consistently scored higher in Pattern X and in imaginative and stimulating classroom behavior (Pattern Z), and men tended to exhibit businesslike and systematic behaviors (Pattern Y). Younger teachers (under 45 years) scored higher than older teachers in patterns

X and Z; older teachers scored higher in pattern Y.

A similar but more recent list of teacher characteristics was compiled by Tuckman (1985; 1986), who developed a feedback system for stimulating change in teacher behavior. His instrument contains 28 bipolar items on which teachers were also rated on a seven-point scale (see Figure 1)

The characteristics cluster into four teacher dimensions, similar to Ryans' patterns.

- **CREATIVE: The creative teacher is imaginative, experimenting, and original; the noncreative teacher is routine, exacting, and cautious.**
- **DYNAMIC: The dynamic teacher is outgoing, energetic, and extroverted; the nondynamic teacher is passive, withdrawn, and submissive.**
- **ORGANIZED: The organized teacher is purposeful, resourceful, and in control; the disorganized teacher is capricious, erratic, and flighty.**
- **WARM: The warm teacher is sociable, amiable, and patient; the cold teacher is unfriendly, hostile, and impatient.**

Most teacher-education institutions adopted the general structure of the trait-factor model. A major aim was the development of teachers who could create a classroom atmosphere where children are personally secure, and where they can think and explore free of anxiety, guilt, and organizational restraints. No longer primarily subject-matter experts, teachers were expected to help children assume responsibility for their own learning. George Mouly (1960) put it this way:

> **Instead of having to concern oneself only with a few patterns of effective presentation of subject-matter, the modern teacher's responsibility is one of making certain that all that goes on in the classroom is of maximum benefit in promoting the all-round benefit of the child . . . . Psychology makes very clear the fact that children must do their own learning: No one can do it for them. Thus, all education is *self-education.*** (p.13)

Advocates of the trait-factor model favor classrooms in which learning derives from students' interests and takes the form of active, self-directed exploration. They emphasize concepts like readiness and personal meaning. They appreciate the interconnections of thinking and feeling. Just as teachers must come to know students as individuals, so students are allowed to know each of their teachers as a person (Combs, 1982).

Combs, a leading proponent of the trait-factor model, argued that teachers' *perceptions* of student behavior are more important than training in specific teaching behaviors, because perceptions guide the selection of actions. Specific teaching techniques have only a limited range of application. Combs has always believed that teacher education programs tend to focus on narrowly defined skills (1972).

Combs' analysis of teacher education has two flaws, according to his critics. First, a student's poor performance may be interpreted in a number of ways, any one of which may be incompatible with the others. For example, low math achievement may be the result of poor preparation in the early grades, lack of support in the home, or a reading problem. The teacher's perception of the problem may be quite different from the explanation provided by another professional, such as a school counselor.

Second, teachers who have perceptual skills still have to come up with effective ways of translating those perceptions into action. Keen insights may provide explanations of behavior, but not necessarily solutions (Floden & Buchmann, 1990).

Nevertheless, the trait-factor model was a major milestone in the evolution of teacher-training programs. The result was a data-base for the development of state teacher certification standards, requiring all who want to teach in kindergarten through high school to meet specified personal and academic standards. Proponents of the trait-factor model continue to generate research on ways to produce caring teachers (Arnstein, 1990; Prawat, 1992). The model has been enhanced by the addition of clinical participation activities in real classrooms, thereby producing a blend of academic and hands-on teacher preparation (Rosenshine & Stevens, 1986).

Instructional Design Model

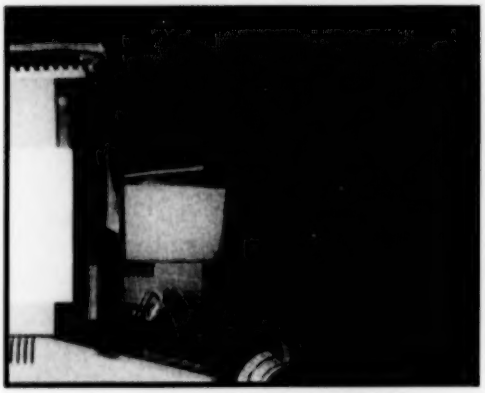
Today, the teacher's role is expanding. Building on a historical foundation of mentoring (Subjectmatter Model) and the enhancement of the total growth of the child in the classroom (Trait-factor Model), the **Instructional Design Model** represents a shift from a psychology of *learning* to a psychology of *instruction*. The teacher focuses not only on the social and emotional growth of students, but increasingly on how to improve their *performance*. The instructional design process is a systematic way of designing, carrying out, and evaluating the total process of teaching and learning in terms of specific objectives. These objectives are based on research in human learning and communication, and employing a combination of human and technological resources to bring about more effective instruction (Banathy, 1990; Reiser, 1987).

Education vs. Training

Evolving information technologies are transforming the nature of work, and this transformation is affecting the design and content of the school curriculum. Much of the role of education today is preparation for work. Therefore, the workplace is changing and schools must change in response. The major shift will involve the merging of *education* and *training*. Traditionally, schools have aimed at broad, societal objectives, such as education for intellectual attainment and education for citizenship. Preparing individuals to enter the world of work has never been the major goal of public education. However, the current perception that the U.S. is losing its technological edge has prompted many educational critics to advocate more technical training than presently exists in most schools (Carnegie Corporation of New York, 1986). Instructional design theory is based on the belief that education and training ought not to be two distinct entities, and that the former will increasingly adopt many of the

objectives and characteristics of the latter (Cruikshank & Metcalf, 1990).

Although the terminology is modern, the distinction between education and training is as old as civilization: "To the Greeks and Romans, education meant the forming of a child into a harmonious, well-balanced adult" (Shermis, 1967, p. 8). In modern times, Jacques Barzun (1959) characterized the goal of education as the transmission of a complex heritage of ideas and attitudes he referred to as "intellect," from one generation to the next. On the other hand, training has its antecedents in the guild system of medieval Europe and in the transmission of trade secrets from parent to child.



The Instructional Design Model emphasizes various delivery systems, not the least of which is computer-assisted instruction.

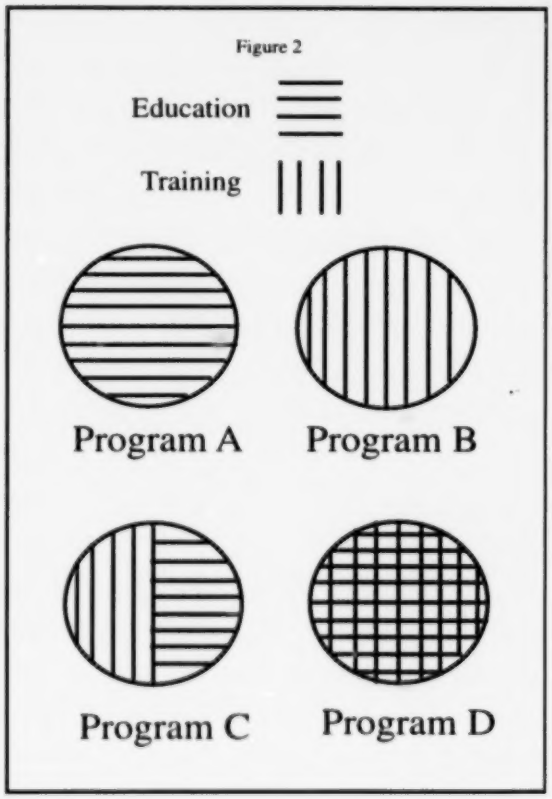
Glaser (1962) characterizes education as a discipline oriented toward the achievement of general objectives such as "becoming a cultured gentleman." He characterizes the objectives of training, on the other hand, in terms of specific, measurable criteria such as the development of a particular skill. Nadler (1982) defines education as "learning related to a future but undefined job for which the individual is being prepared," while he defines training as "learning related to the present job of the individual." Similar definitions can be found in Hall and Miller (1975) and in DePhillips *et al* (1960). While each set of definitions differs from the others in one or more particulars, each identifies education as the acquisition, by an individual, of generalized knowledge and skills in preparation for participation in a democratic society (Bullock, 1986). In contrast, the training of the individual results in the acquisition of specific knowledge and skills that are immediately applicable to an occupational field.

Some may say that the merging of education and training is just an updated version of vocational education, that educational institutions will become "trade schools." Educational institutions will use the methodology of training to achieve educational aims. It will not be incongruous, for example, to say that one of the aims of education is to "train students to think mathematically." Mastery of basic skills and subject-matter content should not be judged solely by a student's ability to pass an examination but should also be judged by how well the student can apply the skills. A student needs to know where and when to do something, as well as how to do it.

Education for Real Life

Education and training make significantly different assumptions concerning the fundamental characteristics of the learner. Knowles (1980) discussed these assumptions while pointing out the differences between **pedagogy**—the education of children, and **andragogy**—the training of adults.

According to Knowles, pedagogy assumes that the learner is a more or less passive recipient of information; that experience outside of the educational environment is of little or no value; that the learner should conform to a standardized curriculum; and that content should be essentially of a theoretical nature. Andragogy, on the other hand, assumes that the learner is an active and interested participant; that the learner possesses a rich store of life experiences that can be used in the learning environment; that the curriculum should be tailored to the needs and interests of the learner; and that content should emphasize applications that are both concrete and relevant to the learner's situation.



These differing assumptions regarding the learner result in distinctly different teaching strategies. Pedagogy, for example, tends to emphasize the rote learning of concepts and, at best, the simu*lation* of problem-solving experience. Andragogy focuses on the "hands-on" learning of skills (Nadler, 1982). The use of lecture tends to characterize the pedagogical environment, while discussion and group projects are more typical of andragogical or training environments (Knowles, 1984). Finally, pedagogy typically employs a comparative basis for the evaluation of student performance (e.g., grades), while the trainer evaluates performance on the basis of specific and measurable competencies (Knowles, 1984).

Focus on the Individual

It should be noted that the major objective of the instructional design model is *individual student achievement*. When teachers and students have frequent opportunities for informal interactions, students tend to feel more comfortable about these interactions and tend to perceive their teachers as being more interested in them as individuals, especially in middle-and high school settings (Newman, 1979). This ability to respond to students as individuals is a central component of successful teaching (Getzels, 1969; Alexander & Eckland, 1975; Martin, 1972). Individual responsiveness builds trust in the teacher-student relationship. This trust builds a connection where teachers may "enter into each student's perspective" (Belenky *et al*, 1986, p. 227). Yet, teachers are facing an increasing *diversity* of

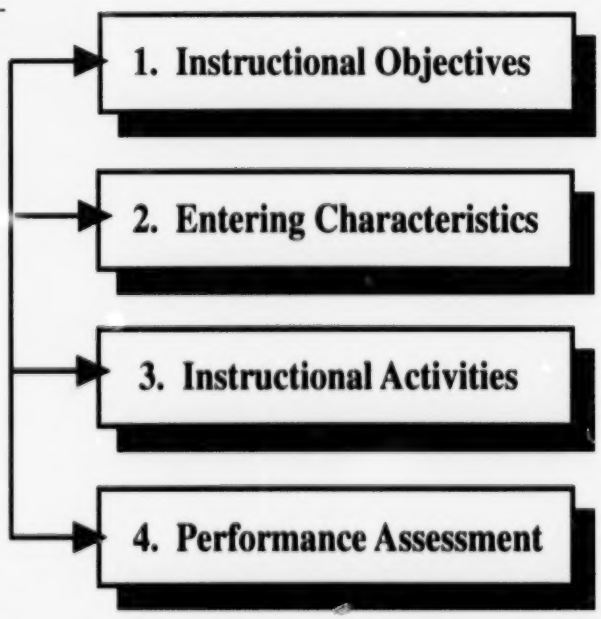
students (Gordon, 1991). Teachers are charged with instructing groups rather than tutoring individuals. They are responsible for the achievement of all of their students. Today, this requires "extraordinary efforts" (Cosden, 1988). Student referrals for special services appear to be generated as a result of behavioral problems and perceptions of "teachability" as much as by their academic performance (Gerber & Semmel, 1984; Kornblau, 1982). That is, teachers often refer students for placement when they feel that they are unable to teach or manage those students successfully. These "unteachable" students, by definition, require from the teacher more than that teacher feels he or she can provide while still meeting the needs of the other students in the program.

Ironically, effective teaching may, in fact, widen the gap between low- and high-achieving students, with average- and above-average students excelling at a rate that increases the gap between themselves and lower functioning students (Kaufman, Gerber, & Semmel, 1988). In effect, those who learn well, will learn proportionately more than those who have difficulty learning.

Curriculum

Figure 2 shows Educational Program A and Training Program B. The objectives of Program A might be the principles and characteristics of the internal combustion machine, while Program B focuses on how to drive a car and do basic maintenance. The student who takes Program A will only have theoretical knowledge of the automobile, but won't achieve any performance objectives. The student who enrolls in Program B may achieve performance objectives without gaining an understanding of the principles involved. Program C shows the two programs offered concurrently, with students enrolled in both courses simultaneously or taking them in tandem. The separation of theory and practice is a less desirable arrangement than the combination of the two.

Figure 3



Program D is an integrated educational/training sequence. Students learn a combination of educational goals and objectives that are intended to foster responsible ownership and use of an automobile. Theory and principles are merged with hands-on experiences and performance objectives to provide a seamless curriculum of learning objectives (Hanis, 1991).

Another example might be a drug education

and awareness program that includes educational goals related to the problems of drug addiction, combined with training objectives such as how to say "no," how to seek help, how to help others resist or overcome a drug problem.

For the U.S. to thrive in the face of intensifying international competition, accelerating technological change, increasing state and federal deficits, and changes in the population and the work force, the learning enterprise must become more productive. We're running out of money for schools. Total education costs per pupil, in constant dollars, have nearly quadrupled since the early 1950's, without any evidence of a proportional improvement in scholastic performance (Perelman, 1988). Educational expenditures represent approximately 7 percent of the GNP, the total value of all goods and services produced annually in the U.S. The nation spends more only on defense, health and welfare, and annual interest payments on the national debt (Guthrie et al, 1988, p. 20).

When an economy is knowledge-based, learning becomes a strategically critical industry. Today, only about 5% of U.S. workers actually make a product on the job. The great majority of the work force is employed in providing services or managing the automated systems that produce goods and services.

The Teacher as Decision-maker

The instructional design model provides for three kinds of decisions: (1) **diagnostic**, (2) **prescriptive**, and (3) **normative**. The model is *diagnostic* because it provides for the following:

1. **Identification of the learner's entering affective and cognitive capabilities.**
2. **Clarification of the aims and objectives of instruction in concert with the student's needs.**
3. **Solutions to the student's learning problems.**

The instructional design model is prescriptive because it is essentially a systematic approach: it provides a framework for an entire instructional unit, as well as being a component of a department-wide, and a school-wide, instructional program. (See Figure 3)

It is normative in that it provides general criteria and procedures for measuring and evaluating the achievement of students. It also provides the feedback loops necessary for revising and updating the entire system.

Instructional Objectives. Instruction begins with a determination of what is to be learned. What do you want each student to be able to do or know? The needs of the learners, your knowledge of the subjectmatter, the requirements of the school curriculum, and the constraints of time and facilities are the bases for deciding what to teach. (See Figure 3, Box No. 1)

Objectives may be organized into categories. For example, Gagne's model of human capabilities describes five categories (See Chapter 2). These comprise verbal information, intellectual skills,

cognitive strategies, motor skills, and attitudes. You can base decisions on any and all of these categories for a given unit of instruction (Gagne, 1985).

Entering Characteristics. (Box No. 2) As you develop the objectives of instruction, you must consider the capabilities and interests of each of your students. For example, if some of your students are poor readers, then your instructional design should provide for a variety of ways to present the content, rather than reading. You also need to consider equisite skills and knowledge. "Is it appropriate to teach this lesson now?" "Do I need to teach something else first?"

Instructional Activities. (Box No. 3) Selecting methods and materials is a daily process. The activities help determine instructional effectiveness. You should consider students' learning styles. Some students will profit from a conventional lecture-and-discussion teaching format while others need hands-on activities. Pictorial or graphic representations clarify and fine tune concept acquisition for many. Computer-assisted instruction may be appropriate for some, but others may need close guidance and feedback from a teacher.

Performance Assessment. (Box No. 4) Measuring and evaluating student performance is an important part of instruction not only for feedback to your students, but to give you some idea of the effect of your instruction. You will probably experiment with different ways to assess performance, balancing the tradeoffs among objective tests, essay exams, projects, and so on. What is evaluated and how it is evaluated should be derived from your instructional objectives. Assessment should answer the question, "Did my students learn what I intended them to learn?" The answer to this question will become the basis for revising your objectives, methods, and materials.

We can summarize most of the elements of the decision-making process in the following questions about instructional design (Hunter, 1971).

- **What performances can the student manage at the entry stage of learning?**
- **What learner behavior is relevant to the task and to the learner's entering characteristics?**
- **What is the primary instructional objective of the unit?**
- **How can the teacher's own competencies and teaching style be used to translate instructional decisions into effective action?**
- **What is the best method of accomplishing the instructional objective?**
- **How will the teacher synthesize the preceding decisions into the teaching-learning process?**
- **How successful was the instructional sequence? Does it need revision?**

A Final Comment

Today, teachers are being overwhelmed by an ever-widening diversity of students. Teachers need help. They need new technologies to extend their teaching skills. Empowering environments enhance human accomplishments by a division of labor: the machine (or technology) handles the routine mechanics of a task, while the teacher concentrates on higher-order instruction (Dede, 1989). In sense, the teacher needs to think of students as workers striving to reach objectives and requiring different kinds of activities and resources to achieve those goals. For some, it could be an occasional lecture, but for others it could be cooperative learning, small-group discussions, videotapes, or computer-assisted learning. The teacher in the classroom will continue to be the leader of the educational enterprise, but he or she will orchestrate learning from a large array of options.

Some experts believe that any attempts to "technologize" teaching into a predictable, step-by-step training program is doomed to failure (See Costa, 1984; Eisner, 1982). They believe that teaching is a holistic or total process, mastered as much by instinct as by rational thought. For example, Eisner (1982) says: "Teachers are more like orchestra conductors than technicians. They need rules of thumb and educational imagination, not scientific prescriptions" (p. 5). My position is that beginning teachers need help in the early stages in order to master the technical aspects of instruction. In time, teachers develop professional competence and a file cabinet full of teaching units and examinations. At that point they begin to focus on the "big picture." We come back to the question posed early in this paper: Is teaching an art or a science? At one end of this continuum, there are those who believe that "good teachers are born, not made"; or, in other words, good teaching is an instinct. At the other end of the continuum, there are those who believe that teaching is a profession based on a science of instruction, whereby teachers can *learn* effective teaching methods. Yes, there are individuals who seem to have a "natural" talent for teaching. They can "teach the phone book." However, I have seen many undergraduates who initially appeared to be poor prospects for teaching, yet by dint of conscientious effort in their teacher-education program, have gone on to become both systematic and humanistic teachers. We believe that the teaching process has evolved from "mentor" through "facilitator" to "instructional designer."

References

Alexander, K. L., & Eckland, B. K. (1975). School experience and status attainment. In S. E. Dragastin & G. H. Elder, Jr. (Eds.), *Adolescence in the life cycle.* New York: Wiley.

Arnstein, B. (1990). Reconstructing teacher education. *Teachers College Record, 92*(2), 230-247. Cambridge University Press.

Banathy, B. H. (1990). *Systems design of education: A journey to create the future.* Englewood Cliffs, NJ: Educa tional Technology Publications.

Barzun, J. (1959). *The house of intellect.* New York: Harper & Row.

Belensky, M. F., Clinchy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Women's ways of knowing: The development of self, voice, and mind.* New York: Basic Books. tutoring. *Educational Researcher, 13,* 3-16.

Bullock, R. D. (1986). *The teacher as trainer.* Unpublished manuscript.

Carnegie Corporation of New York. (1986). *A nation prepared: Teachers for the 21st century.* The Report of the Task Force on Teaching as a Profession. New York: Carnegie Foundation on Education and the Economy.

Combs, A. W. (1967). *The professional education of teachers.* Boston: Allyn & Bacon.

Combs, A. W. (1972). Some basic concepts in teacher education. *Journal of Teacher Education, 23*(3), 286-290.

Combs, A. W., & Snygg, D. (1959). *Individual behavior.* New York: Harper & Row.

Cosden, M. A. (1988). Research implications for difficult-to-teach students. *Educational Psychologist, 23*(3), 295-298.

Costa, A. L. (1984). A reaction to Hunter's knowing, teaching, and supervising. In P. L. Hosford(Ed.), *Using what we know about teaching.* Alexandria, VA: Association of Supervision and Curriculum Development.

Cruikshank, D. R., & Metcalf, K. K. (1990). Training within teacher preparation. In W. R. Houston (Ed.), *Handbook of research on teacher education.* New York: Macmillan.

Darling-Hammond, L. (1985). Valuing teachers: The making of a profession. *Teachers College Record, 87*(2), 205-218.

DePhillips, F., Berliner, D., & Cribbin, J. (1960). *Management of training programs.* Homewood, IL: Irwin *Educational Technology, 28*(7), 27-33.

Eisner, E. W. (1982). *Cognition and curriculum: A basis for deciding what to teach.* New York: Longman.

Eisner, E. W. (1985). *The educational imagination: On the design and evaluation of school programs*(2nd ed.). New York: Macmillan.

Flinders, D. J. (1989). Does the 'Art of Teaching' have a future? *Educational Leadership, 46*(8), 1620.

Floden, E. F., & Buchmann, M. (1990). Philosophical inquiry in teacher education. In W. R. Houston, M. Haberman & J. Sikula (Eds.), *Handbook of research on teacher education.* New York: Macmillan.

Gagne, R. M. (1985). *The conditions of learning* (4th ed.). New York: Holt, Rinehart & Winston.

Gerber, M., & Semmel, M. (1984). Teacher as imperfect test: Reconceptualizing the referral process. *Educational Psychologist, 19,* 137-148.

Getzels, J. W. (1969). A social psychology of education. In G. Lindzay & E. Aronson (Eds.), *The handbook of social psychology* (2nd ed., Vol 5). Reading, MA: Addison-Wesley.

Gingell, J. (1983). Art and knowledge. *Educational Philosophy and Theory, 17,* 10-21.

Glaser, R. (Ed.). (1962). *Training research and education.* Pittsburgh: University of Pittsburgh Press. Scott Foresman/Little, Brown.

Guthrie, J., Garms, W., & Pierce, L. (1988). *School finance and education policy: Enhancing educational efficiency, equality, and choice.* Englewood Cliffs, NJ: Prentice-Hall.

Hanis, R. (1991). *Education vs. training.* Unpublished manuscript.

Highet, G. (1957). *The art of teaching.* New York: Vintage.

Hunter, M. C. (1971). The teaching process. In D. Allen & E. Seifman (Eds.), *The teacher's handbook.* Glenview, IL: Scott, Foresman.

Jackson, P. W. (1965). *Teacher-pupil communication in the elementary classroom: An observational study.* Paper presented at the American Educational Research Association Annual Meeting, Chicago.
development. *Advances in Motivation and Achievement, 3,* 73-106.

Kaufman, J., Gerber, M., & Semmel, M. (1988). Arguable assumptions underlying the regular education initiative. *Journal of Learning Disabilities, 21,* 6-11.

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy* (Rev. Ed.). Chicago: Association Press.

Knowles, M. S. (1984). *The adult learner: A neglected species.* Houston, TX: Gulf.

Kornblau, B. (1982). The teachable pupil survey: A technique for assessing teachers' perceptions of pupil attributes. *Psychology in the Schools,* 19, 170-174.

Martin, E. C. (1972). Reflections on the early adolescent in school. In J. Kagan & R. Coles (Eds.), *12-16: Early adolescence.* New York: Norton.
adults. Paper presented at the meeting of the American Psychological Association, Washington, DC.

Mouly, G. J. (1960). *Psychology for effective teaching.* New York: Holt, Rinehart & Winston.

Mueller, R. J. (1963). 'Enter and Leave Freely' (A description of Count Leo Tolstoy's school at Yasnaya Polyana). *Phi Delta Kappan, XLIV*(9), 435-437.

Nadler, L. (1982). *Designing training programs.* Reading, MA: Addison-Wesley.

Newman, P.R. (1979). Persons and settings: A comparative analysis of the quality and range of social interaction in two high schools. In J. G. Kelly (Ed.), *Adolescent boys in high school.* Hillsdale, NJ: Erlbaum.

Ornstein, A. C. (1990). *Strategies for effective teaching.* New York: Harper & Row.

Perelman, L. J. (1988). Restructuring the system is the solution. *Phi Delta Kappan, 70*(1), 20-24.

Reiser, R. A. (1987). Instructional technology: A history. In R. M. Gagne (Ed.), *Instructional technology: Foundations.* Hillsdale, NJ: Erlbaum.

Rivlin, H. N. (1955). The role of mental health in education. 54th Yrbk, NSSE, Part I, *Mental health in modern education.* Chicago: University of Chicago Press.

Rosenshine, B., & Stevens, R. S. (1986). Teaching functions. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.). New York: Macmillan.

Ryans, D. G. (1959). Some correlates of teacher behavior. *Educational and Psychological Measurement, 19,* 3-12.

Sergiovanni, T., & Starrat, R. (1988). *Supervision: Human perspectives.* New York: McGraw-Hill.

Shermis, S. (1967). *Philosophic foundations of education.* New York: American Book.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Research, 15*(2), 4-21.

Skinner, B. F. (1968). *The technology of teaching.* New York: Appleton-Century-Crofts.

Skinner, B. F. (1983). *A matter of consequences: Part 3 of an autobiography.* New York: Knopf.

Skinner, B. F. (1984). The shame of American education. *American Psychologist, 39,* 947-954.
Verbal Learning and Behavior, 22, 231-244.

Sununu, J. H. (1986). Will technologies make learning and teaching easier? *Phi Delta Kappan, 68*(4), 220-222.
Principals' Bulletin, 90-92.

Thorndike, E. L. (1912). *Education: A first book.* New York: Macmillan.
(Eds.), *Levels of processing and human memory* (pp. 405-428). Hillsdale, NJ: Erlbaum.

Tuckman, B. W. (1985). *Evaluating instructional programs* (2nd ed.). Boston: Allyn & Bacon.

Tuckman, B. W. (1986). Feedback and the change process. *Phi Delta Kappan, 67*(5), 341-344.